

REMARKS

Claims 1-20 are pending in the application. Claims 18 and 19 are withdrawn pursuant to a restriction requirement. Claim 20 has been added by this amendment. No claims are presently allowed.

Claim 1 is amended to clarify that distilled components are deposited in the cold section.

New claim 20 recites the same distillation conditions as claim 5.

No new matter has been added.

Interview Summary

In an in person interview on 03/04/2008, the differences between the presently claimed invention and the prior art was discussed. The subsequent submission of additional unexpected results was also discussed.

Claim Rejections – 35 U.S.C. § 112

Claim 5 has been rejected under 35 U.S.C. § 112, first paragraph as allegedly failing to comply with the written description requirement.

The claim recites that the distilling of the arsenic monochalcogenide and the at least one chalcogenide is carried out at a temperature “below 550°C.” Claim 5 originally recited “below about 550°C.” The original claim 5 provides written description support for “below 550°C.”

Claim Rejections – 35 U.S.C. § 103

Claims 1-17 have been rejected under 35 U.S.C § 103(a) as being allegedly unpatentable over Upton (US 3,209,641 and US 2,804,378) in view of Churbanov et al. (*J. Optoelect. and Adv. Mat.*, 3(2), 341-349 (2001)).

In order to make a *prima facie* case of obviousness, each claim limitation must be disclosed in the references (MPEP 2143.03). Among other deficiencies, none of the references discloses the limitation in claim 1 of distilling the arsenic monochalcogenide and at least one chalcogenide under vacuum in an open distillation system so that distilled arsenic monochalcogenide and distilled at least one chalcogenide are deposited at a cold section of the open distillation system or the limitation in claim 11 of distilling under vacuum in an open distillation system the purified arsenic monosulfide with the sulfur to form distilled arsenic

monosulfide and sulfur. In both independent claims, the compounds are distilled without reacting. The compounds are then reacted in a sealed system.

In Churbanov, As₄S₄ and S are melted and reacted together, and then distilled (p. 346). The order of the steps is different from the presently claimed processes. Upton also teaches the same order of steps as Churbanov, by melting and reacting As and S, then distilling the product (col. 5, line 68-col. 6, line 5).

In the interview of 03/04/2008, the Examiner suggested that the claimed distillation could be considered to be a purification step and that it would be obvious to try to purify the reactants. However, it should be noted that in the present claims, the reactants are distilled together instead of separately, and are sealed into and reacted in the same system in which the distillation takes place. This results in less than 1 ppm of contamination, as stated in the attached declaration. No such distillation or purification is taught or suggested by the references. It is also noted that an obviousness rejection supported by the “obvious to try” rationale should be supported by a number of factual findings under “Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*” 72 F.R. 57526 (2007).

Claims 2-10 depend from and contain all the limitations of claim 1, and claims 12-17 depend from and contain all the limitations of claim 11. The arguments regarding the lack of a *prima facie* case for claims 1 and 11 are applicable to claims 2-10 and 12-17.

Further, as to claim 5, the claim recites that the distillation occurs below 550°C. Churbanov discloses distillation at 700-800°C (p. 347, lines 2-3). The attached declaration includes absorption spectra comparing the absorbance of 3 glasses distilled below 450°C to that distilled at 750°C. The high-temperature-distilled glass shows a very large absorbance at 4 μm due to S-H bonds. This absorbance is greatly reduced in the glass distilled at 450°C. As explained in the declaration, the S-H bonds are created because arsenic monosulfide decomposes at higher temperatures, which allows it to pick up hydrogen from the walls of the distillation vessel. At lower temperatures, arsenic monosulfide does not decompose and pick up hydrogen, resulting in a more useful glass. It should also be noted that an open vacuum distillation system allows for this low temperature distillation. In a closed vacuum, once the materials begin to evaporate, the closed system is no longer under vacuum. The temperature must be raised to continue the evaporation. In the presently claimed open vacuum system, there is no build-up of

evaporated materials, so distillation can continue at the lower temperature. This also applicable to other arsenic monochalcogenides.

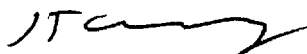
Claims 6-9, 11-13, and 15-17 have been rejected under 35 U.S.C § 103(a) as being allegedly unpatentable over Upton in view of Churbanov and further in view of Jerger (US 2,999,027).

As above, Jerger also does not disclose distilling the arsenic monochalcogenide and at least one chalcogenide under vacuum in an open distillation system. Fig. 1 of Jerger shows that nitrogen gas is pumped into the condensation chamber so that it is neither open nor under vacuum. As all the claim limitations of claims 1 (claims 6-9 dependent thereon) and 11 (12, 13, and 15-17 dependent thereon) are not disclosed in the reference, a *prima facie* case of obviousness has not been made.

In view of the foregoing, it is submitted that the application is now in condition for allowance.

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Respectfully submitted,



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